Title	Theoretical approach to neural phenomena by using symmetry properties(International & Interdisciplinary Symposium on What is Evolution? Bicentennial of Charles Darwin's Birth)
Author(s)	Cho, Myoung Won
Citation	物性研究 (2010), 94(1): 111-111
Issue Date	2010-04-05
URL	http://hdl.handle.net/2433/169287
Right	
Type	Departmental Bulletin Paper
Textversion	publisher

Oct. 16 (Fri.) 11:00-11:20

Theoretical approach to neural phenomena by using symmetry properties

Myoung Won Cho

KIAS 207-43 Cheongnyangni 2-dong, Dongdaemun-gu

Seoul 130-722 Korea

However the complex circuitry and nonlinear dynamics in neural systems, the neural behavior at high levels may obey simple and general rules. As an example, we show that the map formation phenomena at visual cortex can be understood systematically by using only symmetry properties. The highly ordered structure in the mammalian visual cortex has attracted much attention from theoretical neurobiologists and has been thoroughly with the expectation of providing the basis for neural dynamics and computational models. Even though there are quite a number of successful models with unique mechanisms, we show that the typical characteristics of emergent visual maps are so universal ones in other physical systems.

Oct. 16 (Fri.) 11:20-12:00

Evolution-theoretic Approach to Synthetic Study of Intelligence

Hideyuki Nakashima

Future University Hakodate

1. INTRODUCTION

I want to state the following three points:

1. To study intelligence, we need internal observation (endo-system view).
2. A science with endo-system view requires a different methodology, a synthetic loop, from sciences with exo—system view that require analytic loops.
3. The essential driving force of a synthetic loop is the evolutionary method.

2. ENDO-SYSTEM VIEW

Study of intelligence needs different research methodology than natural sciences. In natural sciences, the target system of the study is isolated and observed. The observation should not interfere with the target system. Psychology once tried to apply the same methodology to the study of animal and human intelligence - behaviorism. Experimental